

What is Claimed is:

1. A method of fabricating a Read Only Memory (ROM) device,
comprising:
forming a first conductive layer pattern including a sidewall, on an insulating
layer on an integrated circuit substrate;
5 implanting ions into the integrated circuit substrate using the first conductive
layer pattern as an implantation mask;
thermally oxidizing at least a portion of the integrated circuit substrate and at
least a portion of the sidewall to form a thermal oxide layer on at least the portion of
the integrated circuit substrate and on the sidewall, and to form a buried doping layer
10 from the implanted ions beneath the thermal oxide layer; and
forming a second conductive layer pattern on at least a portion of the thermal
oxide layer and on at least a portion of the first conductive layer pattern.
2. A method according to Claim 1 wherein the first conductive layer
15 pattern includes a bottom adjacent the integrated circuit substrate and a top opposite
the integrated circuit substrate and wherein the thermally oxidizing comprises
thermally oxidizing at least a portion of the integrated circuit substrate and at least a
portion of the sidewall without thermally oxidizing the top and the bottom.
- 20 3. A method according to Claim 1 wherein the first conductive layer
pattern comprises a first conductive layer on the insulating layer and a capping layer
on the first conductive layer and wherein the following is performed between the
thermally oxidizing and the forming a second conductive layer pattern:
removing the capping layer.
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4. A method according to Claim 3 wherein the forming a first conductive
layer pattern on an insulating layer on an integrated circuit substrate comprises:
forming an insulating layer on the integrated circuit substrate;
forming the first conductive layer on the insulating layer;
30 forming the capping layer on the first conductive layer;
forming a photoresist pattern on the capping layer; and
etching the capping layer and the first conductive layer using the photoresist
pattern as an etch mask.

5. A method according to Claim 4 wherein the etching is followed by removing the photoresist pattern.

5 6. A method according to Claim 4:
wherein the following is performed between the forming a capping layer and forming a photoresist pattern:
forming an antireflection layer on the capping layer;
wherein the forming a photoresist pattern comprises forming a photoresist
10 pattern on the antireflection layer; and
wherein the etching is followed by removing the photoresist pattern and the antireflection layer.

7. A method according to Claim 6 wherein the antireflection layer
15 comprises an organic antireflection layer.

8. A method according to Claim 1 wherein the first and second conductive layer patterns both comprise polysilicon.

20 9. A method according to Claim 3 wherein the capping layer comprises silicon nitride.

10. A method according to Claim 1 further comprising selectively programming the ROM.
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11. A method according to Claim 10 wherein the selectively programming comprises selectively implanting ions into the substrate.

12. A method according to Claim 3 wherein the following is performed
30 between the forming a first conductive layer pattern and the implanting ions:
forming a hard mask on the capping layer;
forming a photoresist pattern on the hard mask;
etching the hard mask using the photoresist pattern; and
etching the first conductive layer pattern using the hard mask.

13. A method according to Claim 1 wherein a sidewall spacer is not formed on the sidewall of the first conductive layer pattern between the forming a first conductive layer and the thermally oxidizing.

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14. An integrated circuit substrate Read Only Memory (ROM) device, comprising:

an integrated circuit substrate;

an insulating layer on the integrated circuit substrate;

10 a first conductive layer pattern including a sidewall, on the insulating layer opposite the integrated circuit substrate;

a thermal oxide layer on the integrated circuit substrate and directly on the sidewall of the first conductive layer pattern;

15 a buried doping layer in the integrated circuit substrate beneath the thermal oxide layer; and

a second conductive layer pattern on at least a portion of the thermal oxide layer and on at least a portion of the first conductive layer pattern.

15. A ROM device according to Claim 14 wherein the second conductive layer pattern is directly on the first conductive layer pattern opposite the insulating layer.

16. A ROM device according to Claim 14 wherein the first and second conductive layer patterns both comprise polysilicon.

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17. A ROM device according to Claim 14 further comprising a programming region in the integrated circuit substrate.

18. A according to Claim 17 wherein the programming region comprises an implant region.

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19. A ROM device according to Claim 14 wherein the second conductive layer pattern is not directly on the sidewall of the first conductive layer pattern.